

means to provide cooling flow axially into the interior bore of the bushing.

- 1 14-56. (Newly Presented) The compliant foil fluid film radial bearing of claim 13
- 2 wherein said retainers are generally T-shaped retainers.

REMARKS

Claims 1-56 are pending in the application and new claim 56 has been added to the application. Claims 14 and 16 have been revised to refer to the claim from which they depend. Applicant respectfully requests reconsideration of the application.

Allowed Claims

At the outset, Applicant acknowledges with appreciation the Examiner's indication that claims 1-3 and 19-25 are allowable.

Original Patent

As noted by the Examiner, Applicant will submit the original patent, or a statement as to loss or inaccessibility of the original patent, under separate cover and before the reissue application is allowed.

35 U.S.C. §112, First and Second Paragraphs

Claims 4-18 and 26-55 were rejected under 35 U.S.C. §112, first and second paragraphs, on the assertion that the claimed invention is not described in such full, clear, concise and exact terms as to enable any person skilled in the art to make and use the same, and/or for allegedly failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention.

Section 112, second paragraph of the Patent Act requires that a patent specification conclude with one or more claims "particularly pointing out and distinctly claiming subject

matter which the applicant regards as his invention.” 35 U.S.C. §112, ¶ 2. The Federal Circuit has held the standard for assessing whether a patent claim is sufficiently definite to satisfy the statutory requirement to be as follows: If one skilled in the art would understand the bounds of the claim when read in light of the specification, then the claim satisfies section 112, second paragraph. *E.g., Miles Labs., Inc. v. Shandon, Inc.*, 997 F.2d 870, 875, 27 USPQ2d 1123, 1126 (Fed. Cir. 1993). In other words, “If the claims read in light of the specification reasonably apprise those skilled in the art of the scope of the invention, [section] 112 demands no more.” *Miles Lab., Inc. v. Shandon Inc.*, 997 F.2d 870, 875, 27 USPQ2d 1123, 1126 (Fed. Cir. 1993), *cert. denied*, 114 S. Ct. 943 (1994); *Hybritech Inc. v. Monoclonal Antibodies, Inc.*, 802 F.2d 1367, 1385, 231 USPQ 81, 94-95 (Fed. Cir. 1986), *cert. denied*, 480 U.S. 947 (1987). Applicant requests that each of the 112, second paragraph rejections be reconsidered and withdrawn in light of this case law and the below remarks.

The Examiner rejected claims 4-18 and 26-55 as allegedly indefinite by making the following statement, “The phrase ‘retainers *axially extending* into said interior’ is incorrect where extending radially and axially may be intended.” As exemplified in the specification, it is clear that the phrase “retainers axially extending into said interior” is proper for these claims. For example, one embodiment of the “retainers” in the present invention is described in the specification at column 2, lines 48-51, which states the following:

The interior bore 20 of the bushing 12 includes a plurality of anti-rotation devices or retainers 22 (shown as three, generally T-shaped retainers) which are equally spaced and extend the length of the interior bore 20.

The retainers 22 are also exemplified in detail in Figures 1-3. It is apparent from the specification and drawings that the retainers 22 are extending along an axis through the interior bore 20. Thus, the phrase “retainers axially extending into said interior” is satisfactory claim

language that would be clear to one skilled in the art in light of the specification. Accordingly, the rejection for alleged indefiniteness of the phrase “retainers axially extending into said interior” is not appropriate under the law and applicant respectfully requests that it be withdrawn.

The Examiner has also rejected claims 13 and 36 as allegedly indefinite and asked the following question, “how does ‘the contour[of the] lobe establish [] a converging wedge on the surface of [the] foil’, a separate element?” In claims 13 and 36, the phrase “the contour of each lobe between adjacent retainers establishing a converging wedge on the surface of said compliant foil facing said shaft” appropriately recites an element of one aspect of the invention. For example, the derivation of the “contoured lobes” is discussed in the specification at column 3, lines 26-35. In addition, the compliant foils and the foil undersprings are exemplified to “rest upon” the “contour of the lobes 24.” (*see, e.g.*, col. 3, lines 27-32) The specification also states that the converging wedges will be formed via the foils (*see, e.g.*, col. 2, lines 62-67). Because the contoured lobe and the foil are disposed next to each other, the converging wedges will also be established by the contour of the lobes. Thus, Applicant asserts that this phrase would not lead one skilled in that art to misunderstand the metes and bounds of the claims, and that there is no basis for rejection under 35 U.S.C. §112. Therefore, Applicant respectfully requests that this rejection be reconsidered and withdrawn.

The Examiner rejected the claims 14, 16 and 17 on the allegation that the term “said...retainers” (which Applicant assumes to be “said generally T-shaped retainers”) lacks antecedent basis. It would be clear to one skilled in the art that a dependent claim was inadvertently omitted from the claim set, this rejection is also not appropriate under §112, and should be withdrawn. As originally submitted, claims 14, 16 and 17 were dependent upon claim 13, which recites a “retainer” as opposed to a “generally T-shaped retainer.” In this Response,

Applicant has added new claim 56 to the application, which depends upon claim 13 and which recites the phrase “wherein said retainers are generally T-shaped retainers.” In addition, the dependency of claims 14, 16 and 17 have been adjusted to depend from new claim 56, and its recitation of a “generally T-shaped retainers” term. Accordingly, Applicant asserts that claims 14, 16 and 17, which now depend from claim 56 rather than claim 13, and new claim 56 recite proper antecedent basis and respectfully request that the Examiner reconsider and withdraw this rejection. Accordingly, Applicant submits that all claims are in compliance with 35 U.S.C. §112.

The Examiner also rejected claim 15 and asks “upon what claim does claim 15 depend?” Once again, a rejection under 35 U.S.C. §112 is not appropriate here because it is clear to one skilled in the art as to the meaning of claim 15. As recited in claim 15, “The compliant foil fluid film radial bearing of claim 16,” it is apparent that claim 15 depends upon claim 16. Therefore, this rejection should be reconsidered and withdrawn as well. The Examiner is invited to renumber claims 14-56 after providing a notice of allowance for all claims.

35 U.S.C. §102(b)

Claim 13 is rejected under 35 U.S.C. §102(b) as allegedly anticipated by U.S. Patent No. 5,116,143 to Saville (“Saville”). This rejection is respectfully traversed.

The present invention is directed to a multi-segment radial bearing including a bushing, a shaft or rotor, a plurality of compliant foils and a like plurality of foil undersprings, with the interior bore of the bushing including a plurality of anti-rotation retainers that are spaced through the axial length of the interior bore. In one embodiment of the invention, the shape of the interior bore is non-cylindrical. In this embodiment, the anti-rotation retainers may divide the interior bore of the bushing into a like plurality of lobes, with each lobe having a compliant foil and a foil underspring disposed between the retainers. In operation, the contour of each lobe is

designed to establish a converging fluidic wedge that forces the compliant foil away from the shaft and prevent contact between the moving and non-moving parts of the bearing.

In contrast, the Saville document is said to relate to a high load capacity journal foil bearing that includes a shaft rotatably supported within a bushing by means of a foil bearing comprising a plurality of overlapping compliant foils and undersprings. As shown in Figure 4, the undersprings comprise a plurality of axially extending curvilinear beams having various widths. In the Saville bearing, it is said that the purpose of varying the widths of the beams is to maintain a fluidic wedge shape spacing between the compliant foils and the rotating shaft.

Saville does not suggest or disclose, however, a foil radial bearing comprising a bushing having a non-cylindrical interior bore including a plurality of spaced retainers axially extending into said interior bore and a like plurality of contoured lobes between adjacent retainers. Further, Saville does not suggest or disclose employing the contour of each lobe to establish a converging wedge on the surface a compliant foil facing the shaft. Instead, the Saville bearing is said to vary the width of a plurality of curvilinear beams in order to provide appropriate wedge shape spacing. Thus, the Saville document does not suggest or disclose “a bushing having a non-cylindrical interior bore including a plurality of equally spaced retainers axially extending into said interior bore and a like plurality of contoured lobes between adjacent retainers” where “the contour of each lobe between adjacent retainers establishing a converging wedge on the surface of said compliant foil facing said shaft” as recited in claim 13. Accordingly, Applicant respectfully submits that claim 13 patentably distinguishes over Saville.

In view of the foregoing, Applicant respectfully submits that claims 1-56 patentably distinguish over the references of record and are in condition for allowance. Reconsideration and withdrawal of the rejections are respectfully solicited.

Respectfully submitted,

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REWRITTEN CLAIMS WITH MARKINGS SHOWING CHANGES

1 14. (Once Amended) The compliant foil fluid film radial bearing of claim 56 [13]
2 wherein said generally T-shaped retainers are symmetrical.

1 16. (Once Amended) The compliant foil fluid film radial bearing of claim 56 [13]
2 wherein said generally T-shaped retainers are asymmetrical.

1 17. (Once Amended) The compliant foil fluid film radial bearing of claim 56 [13]
2 wherein said generally T-shaped retainers include radial openings to provide cooling flow to said
3 interior bore of said bushing.

1 56. (Newly Presented) The compliant foil fluid film radial bearing of claim 13
2 wherein said retainers are generally T-shaped retainers.